



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/073,948	02/14/2002	John Rhoades	032658-024	6384

42015 7590 09/13/2006

POTOMAC PATENT GROUP, PLLC
P. O. BOX 270
FREDERICKSBURG, VA 22404

EXAMINER

PAN, DANIEL H

ART UNIT PAPER NUMBER

2183

DATE MAILED: 09/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/073,948	RHOADES ET AL.	
	Examiner	Art Unit	
	Daniel Pan	2183	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 June 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9, 11-17, 20-44, 46-50, 52-56 and 58-60 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9, 11-17, 20-44, 46-50, 52-56 and 58-60 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 September 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

1. Claims 1-9,11-17,,20-44,46-50, 52-56,58-60 remain for examination. Claims 10,18,19,45,51,57 have been canceled.
2. Claims 1-9 , 11 , 17,19, 20-22, 32, 34 , 38, 40, 44, 46, 50,52,56, 59,60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Childers et al. (5,986,913) in view of Campbell et al. (5,021 ,947)
3. Claims 12,13 , 35, 41, 47,53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Childers et al. (5,986,913) in view of Gove et al. (5,371 ,896).
4. Claims 23-31, 58 are rejected under 35 U.S.C. 102(a) and (b) as being anticipated by Horst (5,404,5j0).
5. Claims 14,15, 33,36,37, 42,43, 48,49, 54,55 are rejected under 35 U. .S.C. 103(a) as being unpatentable over Brown (5,872,993) in view of Childers et al. (5,986,913).
6. Claim 16 rejected under 35 U.S.C. 103(a) as being unpatentable over Childers et al. (5,986,913) in view of Brown (5,872,993) .
7. The rejections are maintained and incorporated by reference the last Office action on 01/09/06.
8. The response filed by applicant on 06/30/06 has been fully considered but is not persuasive.

9. In the remarks, applicant argued that :

- a) Childers is directed to discrete packets which have a uniform size while the applicant's claim 1 is of potentially varying size;
- b) Childers is based purely on number of pixels and number of PEs, and there is no particular choice of bit numbers;
- c) applicant's allocation is based on data bandwidth/packet size as opposed to pixel number;
- d) Nothing changes from line to line and from time to time;
- e) Applicant's specification teaches each processor handles a batch of packets sufficient to fill the local memories of its PEs, In effect it consumes a near constant amount of line bandwidth per processing phase, rather than a constant number of packets;
- f) in applicant's invention , some PEs may remain empty;
- g) Campbell's allocation was based on heuristic costs , and did not mention packet size;
- h) claim 12 defines the processing element as being operable to enter a standby mode of operation in dependence upon data received by that processing element;
- i) Gove's SIMD pause was not dependent on data as required by claim 12, but was instead dependent on the occurrence of contention in a separate unit;
- j) applicant's I/O mechanism is shared by all PEs;
- k) Horst can not be possibly be SIMD;
- l) a more complex accelerator is required which, although it may receive data

Art Unit: 2183

sequentially, will have to be parallel internally (typically pipelined) so it can process several of the requests at once. At any point in time, there may be several data items queued up waiting to be processed by the accelerator, several being processed and several being returned to the PEs. In order to avoid inefficiencies for the SIMD processor, it must be able to do something else while this is happening. This requires (a) multi-threading and (b) an I/O mechanism that allows the data to be returned to the PE memory while the PEs are otherwise involved with something else, that is, effectively without their direct intervention. This is significantly more complex than a sequential processor where the data could just be returned to shared memory. On the contrary, the memory of PEs in a SIMD processor is typically "private" (to each PE) rather than shared. The communication between the SIMD processor and the accelerator needs a mechanism to "tag" each data item with the identity of the originating PE so it can be returned to the correct place. In this regard it is important to note that because the SIMD processor will not return to processing the data returned by the accelerator until all the data has been returned (or there is a timeout) there is no need to re-order the data if it is returned out of order as long as it is returned to the correct PE. This alone constitutes a significant Technical difference over the prior art.

m) it is noted that arguments in regard to claims 33,36,37,42,43,48,49,54,55 put forth in previous responses have gone without comment from the office .

n) Brown, too, fails to disclose an input device operable to distribute whole data

Art Unit: 2183

packets of potentially varying size across one or more processing elements such that the number of processing elements across which each whole data packet is distributed is dynamically determined based at least in part on the size of the whole data packet" and therefore fails to make up for the deficiencies of Childers et al. Because these features would be lacking in any combination of Childers et al. with Brown, such a combination would fail to support prima-facie case of obviousness.

10. As to a) above, applicant is kindly reminded that uniform size does not necessarily mean no potentially varying size. A uniform size packet could be potentially varying in size upon change of system parameter. Applicant never recites what "potential" is ? In fact, Childers taught the bit sizes may be varied according to application (see col.4, lines 7-14). Therefore, Childers was potentially varying size.

11. As to b) , Childers taught clearly each pixel may be represented by total of 40 bits (see col.7, lines 41-46). Therefore, Childers was based on the bit numbers.

12. As to c), pixel number was a packet size based on Childers (see each pixel represented by total of 40 bits in col.7, lines 41-46).

13. As to d) , see the citation of the varying size in Childers in the response to a) above.

Art Unit: 2183

14. As to e,f), applicant is reminded that unclaimed features cannot be used to overcome the prior art (e.g. see CCPA In re Lundenberg & Zuschlag, 113, USPQ 530, 534 (1957)).

As to g), Campbell taught the heuristic costs were directed to the goal of minimizing the inter PE communication traffic (see col.15, lines 14-20), therefore, is must be dependent on the data conditions, such as the data congestions and bandwidth. Therefore, Campbell's allocation was based on data. See the variable length packet in col.8, lines 5-18).

15. As to i, Gove's SIMD pause was dependent on data because it was dependent on the occurrence of the contention by the simultaneous accesses by the system devices, and the contention was directed to accesses of the data in the memory. Therefore,, Gove's SIMD pause was dependent on the data.

16. As to j), see response to e,f above.

17. As to k), Horst taught SIMD in the background of the invention (see col.1, lines 10-14), and Horst also taught his invention was in the field of parallel processing and multiprocessor computer systems (see col.1, ines 4-10). Therefore, SIMD was most likely in Horst because it provided the background of the invention.

18. As to l) . above, Brown already taught simultaneous and multiple accesses (see Brown) , therefore it was parallel internally so it can process several of the requests at once. As to the (a) multi-threading and (b) an I/O mechanism, the private memory in PE, and the tag, see response to e,f above.

19. As to m), there was no argument regarding the claims 33,36,37,42,43,48,49,54,55 in previous response. The applicant's response on 10.24.05 (see page 22, lines 30-32, page 23, lines 1-6), contains no arguments regarding these claims except general allegation of the dependent claims were distinguishable over the prior art. No specific limitations or argument was included in applicant's response;

As to n), applicant failed to provide reasons why applicant thinks that Brown, too, fails to disclose an input device operable to distribute whole data packets of potentially varying size across one or more processing elements such that the number of processing elements across which each whole data packet is distributed is dynamically determined based at least in part on the size of the whole data packet. Brown was used to supplement the teaching of the hardware accelerator (see discussions as set forth in paragraph 25 of the last office action on 01/09/06). The reasons of obviousness were already provided in the last Office action. Therefore it will not be repeated herein.

20. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dan Pan whose telephone number is 571 272 4172. The examiner can normally be reached on M-F from 8:30 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chan, can be reached on 571 272 4162. The fax phone number for the organization where this application or proceeding is assigned is 703 306 5404.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

21 Century Strategic Plan

DANIEL H. PAN
PRIMARY EXAMINER
GROUP

